

CIENFUEGOSIA CAV. EXTENDED TO MADAGASCAR

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My earlier revision of the genus *Cienfuegosia* (Fryxell, 1969) did not recognize any representatives of that genus on the island of Madagascar, although reference was made (p. 198) to Ulbrich's statement that *C. hildebrandtii* Garcke occurred there. No basis was known then, nor is known now, for Ulbrich's assertion.

However, an examination of the description and illustration of *Hibiscus humbertianus* Hochr. in the *Flore de Madagascar* (Hochreutiner, 1955) suggested the possibility that this species was a *Cienfuegosia*. Consultation of the original description revealed that Hochreutiner had acknowledged but rejected this possibility. In his later treatment he does not mention this similarity, but in placing it in *Hibiscus* states only (Hochreutiner, 1955: 68), "Espèce très distincte, ne ressemblant en rien aux autres espèces de la section [*Spatula* Hochr.] et même du genre." The examination of authentic material confirms Hochreutiner's statement that this species is poorly accommodated in *Hibiscus* and also confirms his earlier suspicion that a placement in *Cienfuegosia* might be correct.

Hochreutiner rejected a placement of *Hibiscus humbertianus* in *Cienfuegosia* for two reasons: (a) *H. humbertianus* has a 5-lobed stigma and a 5-celled fruit, whereas these structures are typically 3-4-merous in *Cienfuegosia*; and (b) *H. humbertianus* lacks the black punctiform glands ("gossypol glands") in the calyx that are prominent in many species of *Cienfuegosia*. However, *Cienfuegosia drummondii* (A. Gray) Lewton has a (4-)5-merous gynoecium, and several species have the gossypol glands restricted in distribution from certain plant parts, including absent from the calyx (or nearly so) in *C. hildebrandtii* Garcke and *C. hearnii* Fryx. The transfer of *H. humbertianus* to *Cienfuegosia*, therefore, does not unduly stretch the generic boundary of *Cienfuegosia*. Characters that support such a transfer include the following:

1. *Style and stigmas*. The style is single or very slightly divided apically and surmounted by five capitate stigmas. Hochreutiner notes a resemblance to *Thespesia* in reference to the undivided style, but the stigmas in *Thespesia* are decurrent rather than capitate. The style and stigma characters of *Hibiscus humbertianus* are similar to those found in species of *Cienfuegosia* sect. *Paraguayana* Fryx. and *Cienfuegosia* sect. *Friesia* Fryx., except that all except one (*C. drummondii* (A. Gray) Lewt.) of the eight species included in these two sections have three stigmas rather than five. In *Hibiscus*, on the other hand, the styles are typically free above with the five capitate stigmas widely separated.

2. *Foliar nectaries*. The leaves each bear a nectary near the base of the midrib on the abaxial surface. In this respect, and in general leaf conformation, *Hibiscus humbertianus* is similar to species of *Cienfuegosia* sect. *Garckea* Fryx.

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Such nectaries are found in most species of the eight genera that comprise the tribe Gossypieae, in which *Cienfuegosia* is included (Fryxell, 1968). In *Hibiscus* they occur (to my knowledge) only in species of sect. *Furcaria* DC. (e.g. *H. furcellatus* Lam.), sect. *Azanza* DC. (e.g. *H. tiliaceus* L.), and sect. *Lilibiscus* Hochr. (e.g. *H. rosa-sinensis* L.). None of these sections could accommodate the species in question.

3. *Gossypol glands*. The tribe Gossypieae is distinguished from other tribes of the Malvaceae (and indeed from other angiosperms) by the possession of gossypol glands (Lukefahr & Fryxell, 1967; Fryxell, 1968). These structures are lacking in *Hibiscus*. Although they are sometimes obscure in *Cienfuegosia* (especially in species of sect. *Friesia*), they may be demonstrated in all species. In *H. humbertianus* these glands are present in abundance on the leaf lamina, although they may be obscured by pubescence. (They are best observed on the undersurface of young leaves.) A few also occur on the petals, although they are not prominent because they are not dark-pigmented.

Additional characters to support the correctness of this transfer (cf. Fryxell, 1968) may be sought in chromosome number, in embryo morphology, and in phytochemical tests for the presence of gossypol, a substance that has been shown to occur in all species of *Cienfuegosia* tested (Lukefahr & Fryxell, 1967). As yet, material for the evaluation of these characters is not available.

Cienfuegosia humbertiana (Hochr.) Fryxell, comb. nov.

Hibiscus humbertianus Hochr., Candollea 5: 9. 1932. [Type: *Humbert & Swingle 5468* (P.)] Fl. Madag. 129 Fam. Malv. 66. t. 28. f. 3-7. 1955.

Small *shrub* with glabrescent, cicatricose, woody twigs. *Leaves* small (5-10 mm long), ovate or sometimes reniform to trilobed, basally truncate, serrate (the teeth sometimes spinescent), with coarse stellate pubescence on under-surface (the hairs 3-4-armed, the arms 1 mm long, spiniform) together with very fine, simple hairs (0.1-0.2(-0.3) mm long) with recurved, sharp tips (uncinate hairs), the fine pubescence predominating on the upper surface, both surfaces with "pitted" appearance resulting from the presence of sunken gossypol glands. *Petioles* exceeding lamina, densely covered with fine, uncinata hairs. *Stipules* subulate, 1 mm long, rigid, sometimes persistent even after leaf abscission. *Pedicels* axillary, solitary, 1.5-2 cm long, articulated near apex, densely covered with fine, uncinata hairs. *Involucral nectaries* lacking. *Involucre* of ca. 9 bracteoles; bracteoles distinct, spatulate, ca. 3 mm long, obtuse to acute, invested with fine uncinata hairs and a few coarser hairs. *Calyx* ca. 6 mm long, 5-lobed, ca. half-divided, with pubescence similar to that of under leaf surface. *Petals* white, obovate, 12 mm long, 6-7 mm broad, glabrous, with a very few (0-10) translucent gossypol glands scattered in lower half that are best observed with transmitted light. *Androecium* glabrous, pallid; filaments ca. 2 mm long. *Style* undivided, glabrous, exceeding staminal column by ca. 3 mm; stigmas 5, capitate, nearly distinct or coalescent into a single structure. *Capsule* globose, ca. 6 mm in diameter, 5-celled, with both fine uncinata

pubescence and coarse stellate hairs (the latter sometimes simple). *Seeds* unknown.

Specimens examined:

MADAGASCAR: Delta de la Linta (Côte Sud-ouest), alt. 1–10 m, *Humbert & Swingle* 5468 (P). Ambovombe, *Decary* 3445 (P); *Decary*, 1925 (P).

The taxonomic placement of *C. humbertiana* within *Cienfuegosia* presents problems. Its possession of foliar nectaries, its leaf conformation, its shrubby growth habit, its articulate peduncles, and its African distribution, all suggest a placement in sect. *Garckea*. However, its capitate stigmas, its pentamerous gynoecium, its lack of involucre nectaries, and its spatulate involucre bracteoles suggest a placement in sect. *Paraguayana*. The combination of these several characters suggests its removal from both of the above sections and the establishment of a new section, as does the unique and specialized indumentum of *C. humbertiana*, its pallid corolla, and, to some degree, its isolated geographical occurrence. The distinctive uncinata hairs that occur in abundance in this species are similar in form to the recurved spines of the fruits of *Triumfetta* series *Uncinatae* (Lay, 1950), although they are much smaller. The combination of characters noted above, moreover, is anomalous not only for these two sections, but for the respective subgenera to which these sections belong: *Cienfuegosia* subgen. *Articulata* Fryx. and *C.* subgen. *Cienfuegosia*. Because these two subgenera are discrete cytologically with $n = 11$ and 10 , respectively (Fryxell, 1969; Wilson & Fryxell, 1970), the chromosome number of *C. humbertiana* (as yet unknown) will have considerable bearing on its taxonomic placement.

In view of the above uncertainties, it is felt best to leave *C. humbertiana* incertae sedis for the present with the possibility acknowledged that a distinct subgenus may need to be erected to accommodate it when it becomes more fully known.

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